Meeting the New Ozone Standard: Challenges & Opportunities

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July 17, 2008

Topics

- OTC Background
- NAAQS Background
- Air Quality Challenges
  - Regional transport of pollutants
  - Climate and air quality interaction
  - New ozone standard
- Opportunities for Energy Efficiency & Clean Energy

OTC Background

- OTC was created under the Clean Air Act Amendments of 1990 and has been coordinating regional planning and control measure development
- States submitted plans (SIPs) for 2005 attainment with the 1-hour standard that actually worked !!!
- SIPs for attaining the new, tougher ozone standard by 2010 are finalized and submitted
- OTC is beginning work on regional strategies for the new ozone standard

NAAQS Background

- The Clean Air Act Amendments of 1990 requires EPA to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to human health and the environment
  - Primary standards set limits to protect public health
  - Secondary standards set limits to protect public welfare
- EPA has set NAAQS for 6 criteria pollutants: carbon monoxide, lead, nitrogen dioxide, PM10, PM 2.5, ozone and sulfur dioxide
- EPA is required to review the NAAQS at 5-year intervals and revise them as may be appropriate
  - Must consider the recommendations of an independent review committee, the Clean Air Scientific Advisory Committee (CASAC)
  - EPA must explain any differences between the proposed/final NAAQS and the CASAC recommendation in its rulemaking

New and Newer NAAQS & Other Requirements

- 1997 8-hr ozone NAAQS = 0.084 ppm
- 1997 Annual PM 2.5 NAAQS = 15 µg/m^3
- 2006 24-hr PM 2.5 NAAQS = 35 µg/m^3
- 2006 24-hr PM 10 NAAQS = 150 µg/m^3
- 2008 8-hr ozone NAAQS = 0.075 ppm
- Secondary standards for ozone and PM are the same as the primary standards

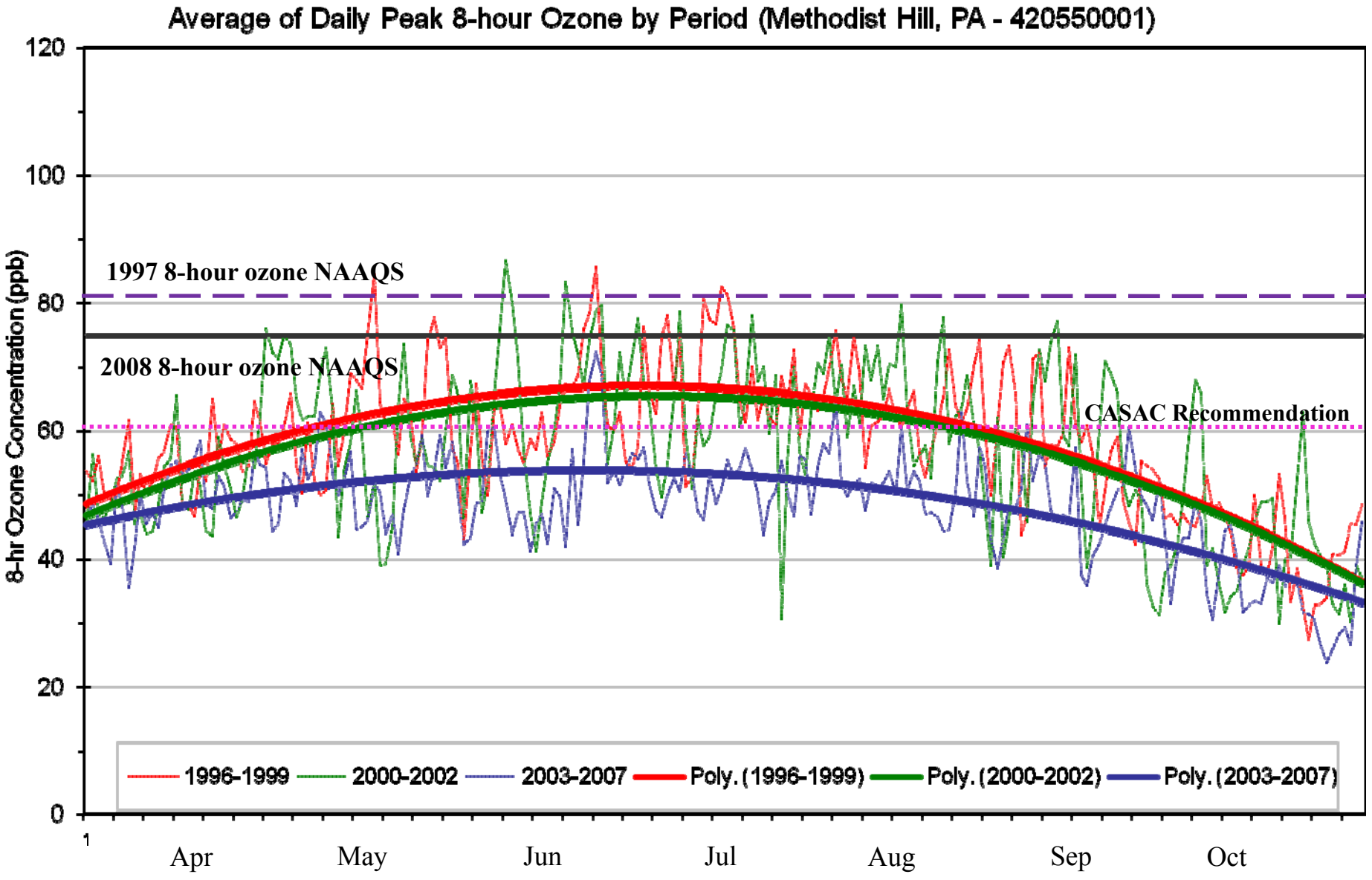
Control Programs for 2010 Ozone Attainment

- Old and new control programs both contribute considerably towards 2010 attainment
- Older programs - “On The Books” or “On The Way”
  - State and federal mobile source controls, earlier NOx controls at EGUs, NOx and VOC RACT, earlier efforts on consumer products, coatings, gas cans, other area sources, etc., etc., etc.
- More recent programs
  - State Multi-P EGU control programs and CAIR
  - 2nd ,sometimes 3rd ratcheting down of consumer products, coatings and gas can controls
  - Industrial, commercial and institutional (ICI) boilers, asphalt, cement and glass manufacturing
  - Paving and other amended VOC rules.
  - Non-traditional efforts like the High Electricity Demand Day (HEDD) Program and voluntary local efforts

Air Quality Challenges for States

- Regional Transport
  - Ozone is still a regional issue
  - Critical need for more aggressive controls to reduce transport under new standard
- Intersection between climate change and ozone: dealing with the “climate penalty”
  - Means having to do more to get to same amount of air quality improvement as compared to past
- New NAAQS for Ozone
  - How &where to get more emissions reductions in the OTR
  - States’ ability to address some source sectors, e.g., mobile, very limited

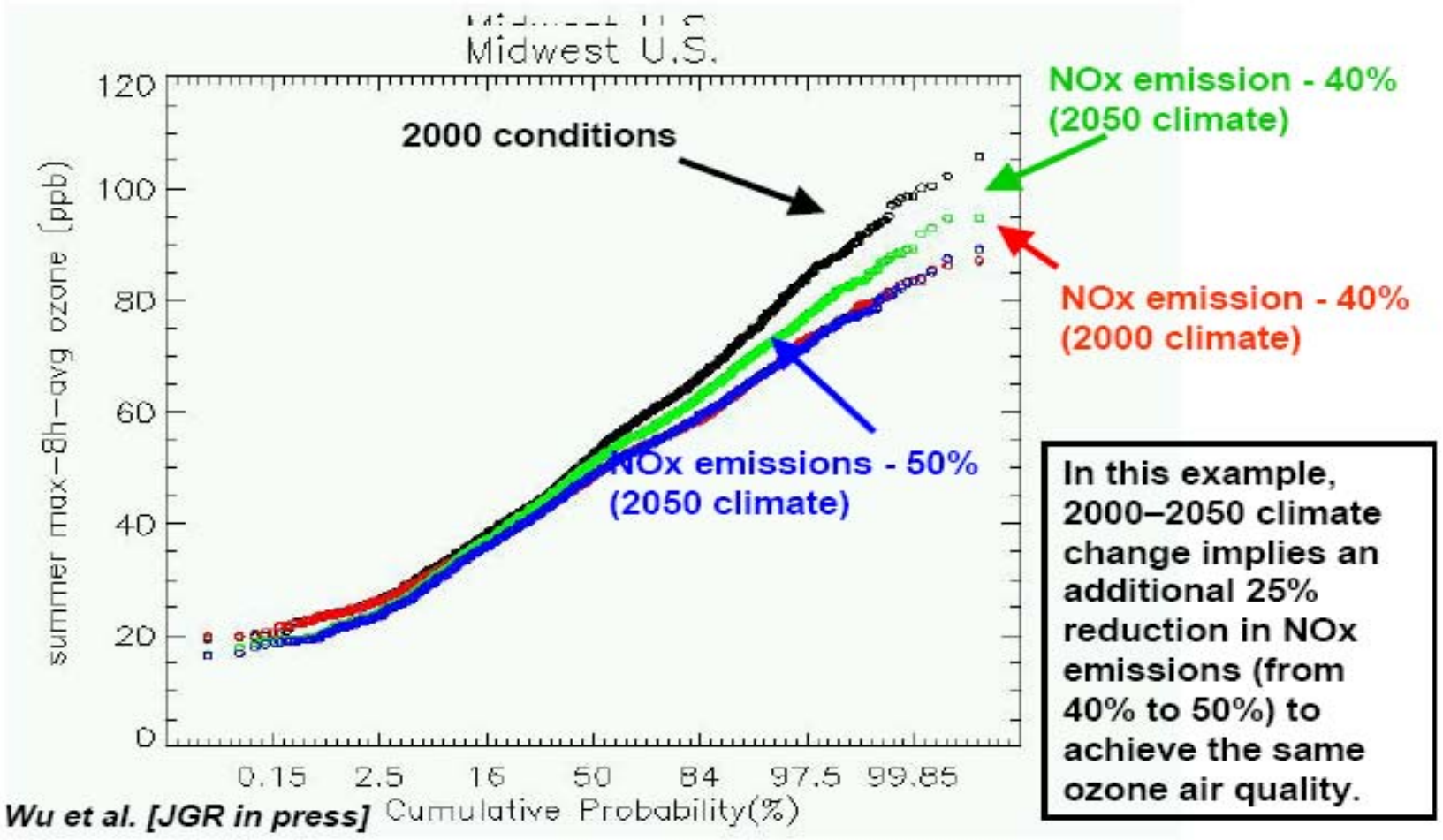
Elevated Reservoir Effect from Transport (1996-2007)



Slide Courtesy of MDE. Note: 2006 & 2007 data are preliminary.

Temperature and Air Quality

CLIMATE CHANGE PENALTY: MEETING A GIVEN AIR QUALITY GOAL WILL REQUIRE GREATER EMISSION REDUCTIONS IN FUTURE CLIMATE



Wu et al. [JGR in press]

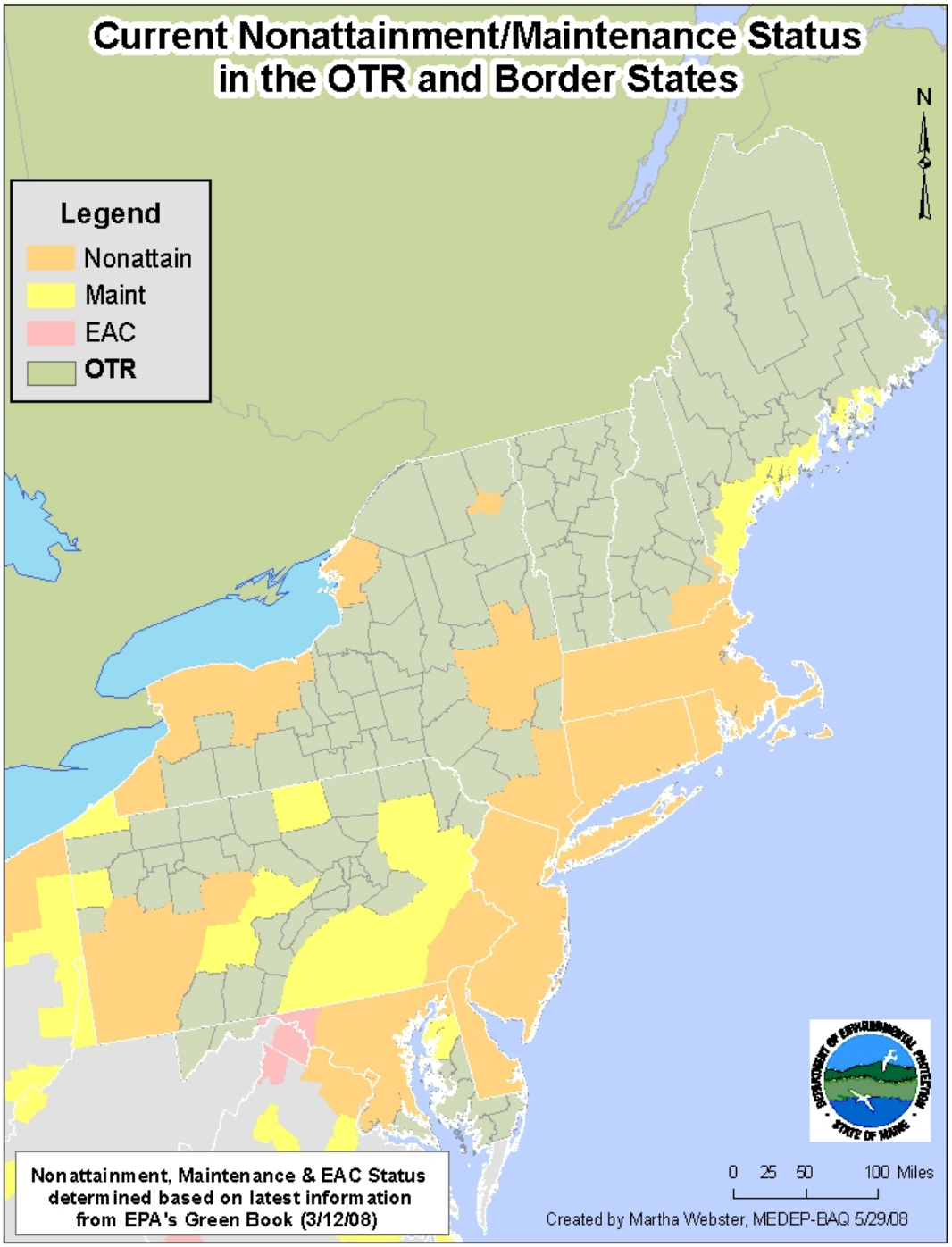
In this example, 2000–2050 climate change implies an additional 25% reduction in NOx emissions (from 40% to 50%) to achieve the same ozone air quality.

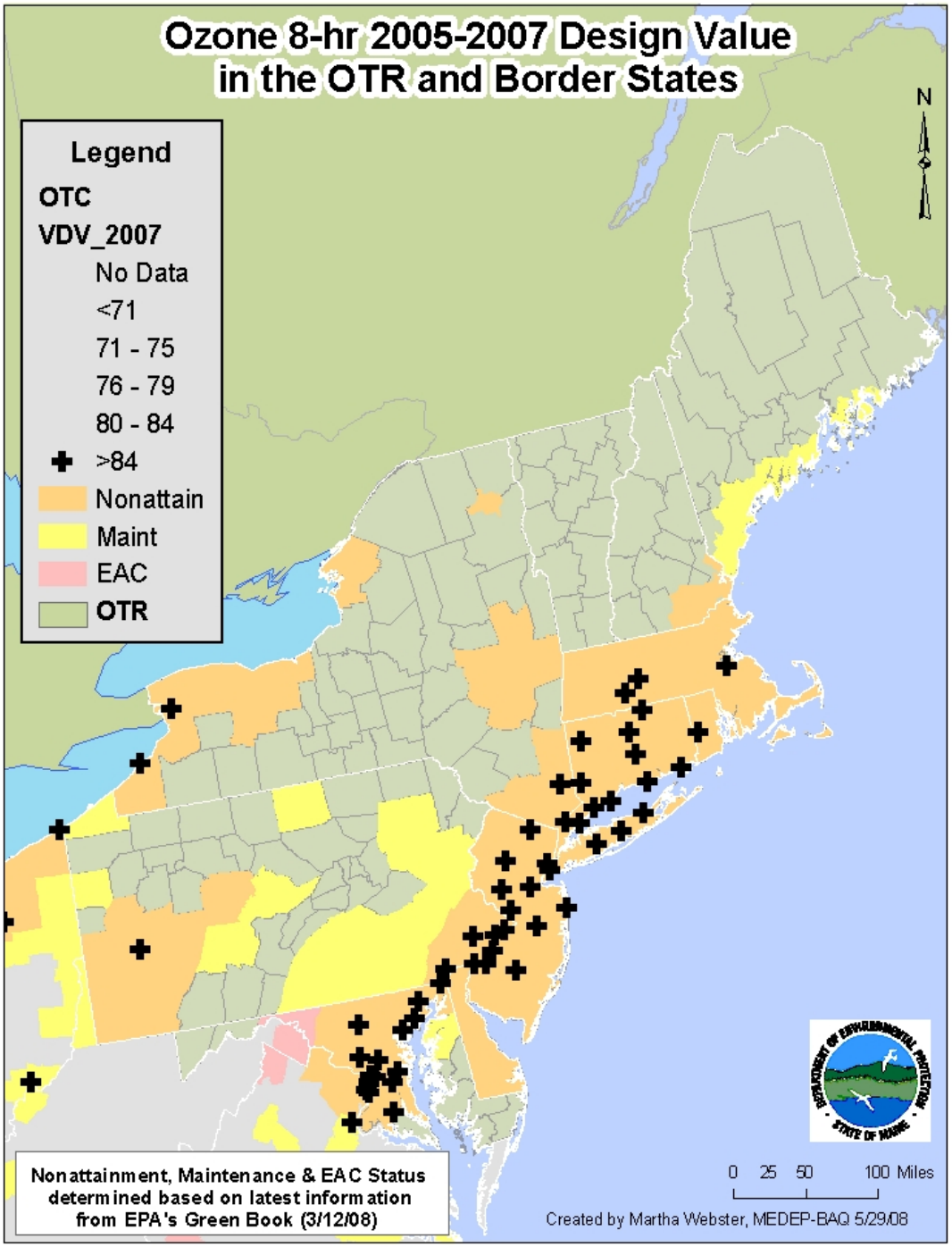
New National Ozone Standard

- Recent studies show significant health impacts at lower ambient concentrations of ozone
- EPA strengthened the 8-hour primary ozone standard to 0.075 ppm (previously 0.08 ppm)
- Secondary standard same as primary
- Will effect many new locations
  - Presents new challenges in new areas
  - Requires another round of attainment planning

CASAC Recommendation

- Scientists advised EPA set ozone NAAQS at a level between 0.060 – 0.070 ppm
- Many OTC states pushed for the ozone NAAQS to be set in accordance with the CASAC recommendation
- EPA's decision foregoes substantial health benefits
  - A recent study co-funded by OTC and NESCAUM show between $300 M - $1.4 B in potential health benefits from a 0.070 ppm ozone NAAQS


Current Nonattainment/Maintenance Status
in the OTR and Border States
N
Legend
Nonattain
Maint
EAC
OTR
Nonattainment, Maintenance & EAC Status
determined based on latest information
from EPA's Green Book (3/12/08)
0 25 50 100 Miles
Created by Martha Webster, MEDEP-BAQ 5/29/08


Ozone 8-hr 2005-2007 Design Value
in the OTR and Border States
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OTC
VDV_2007
No Data
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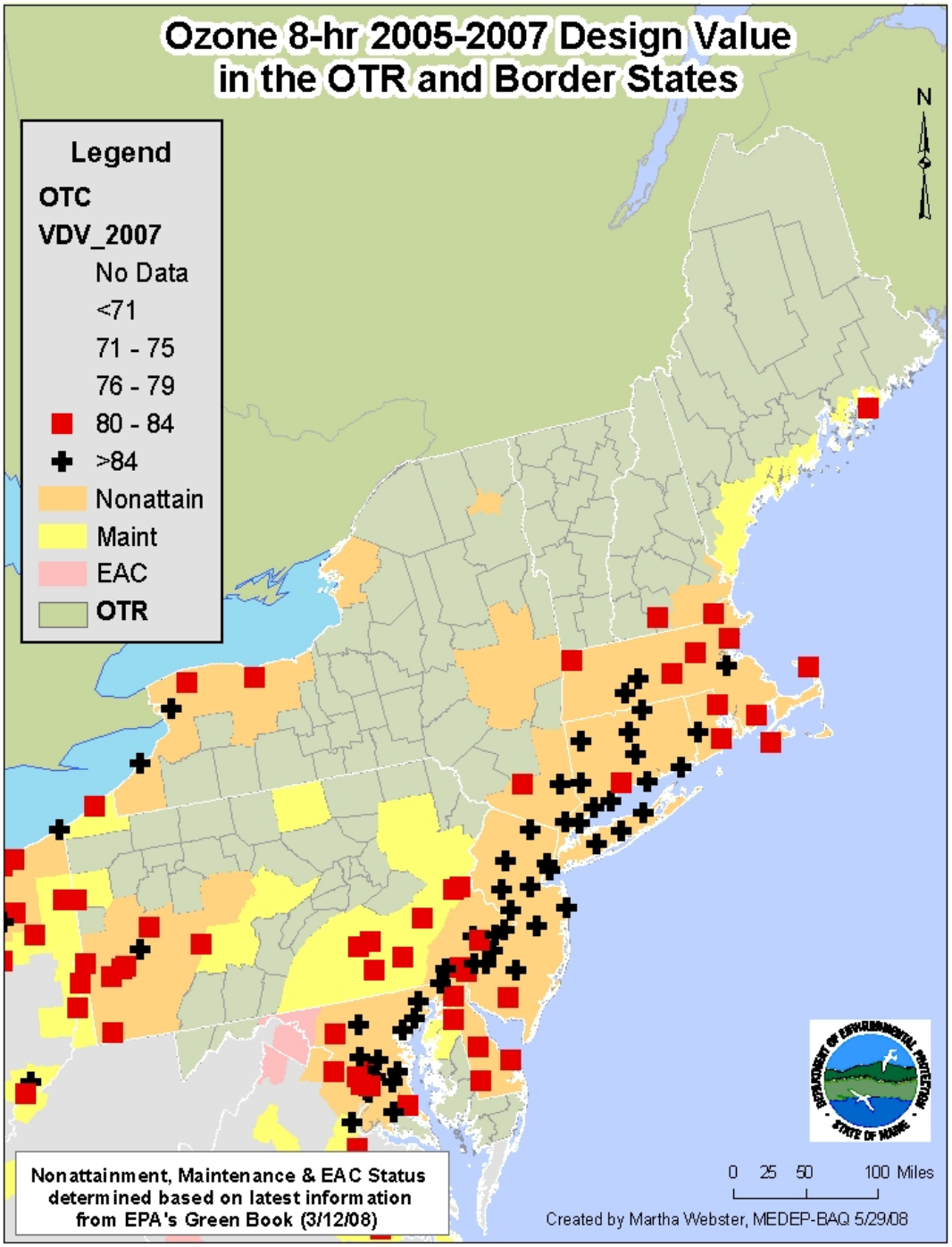
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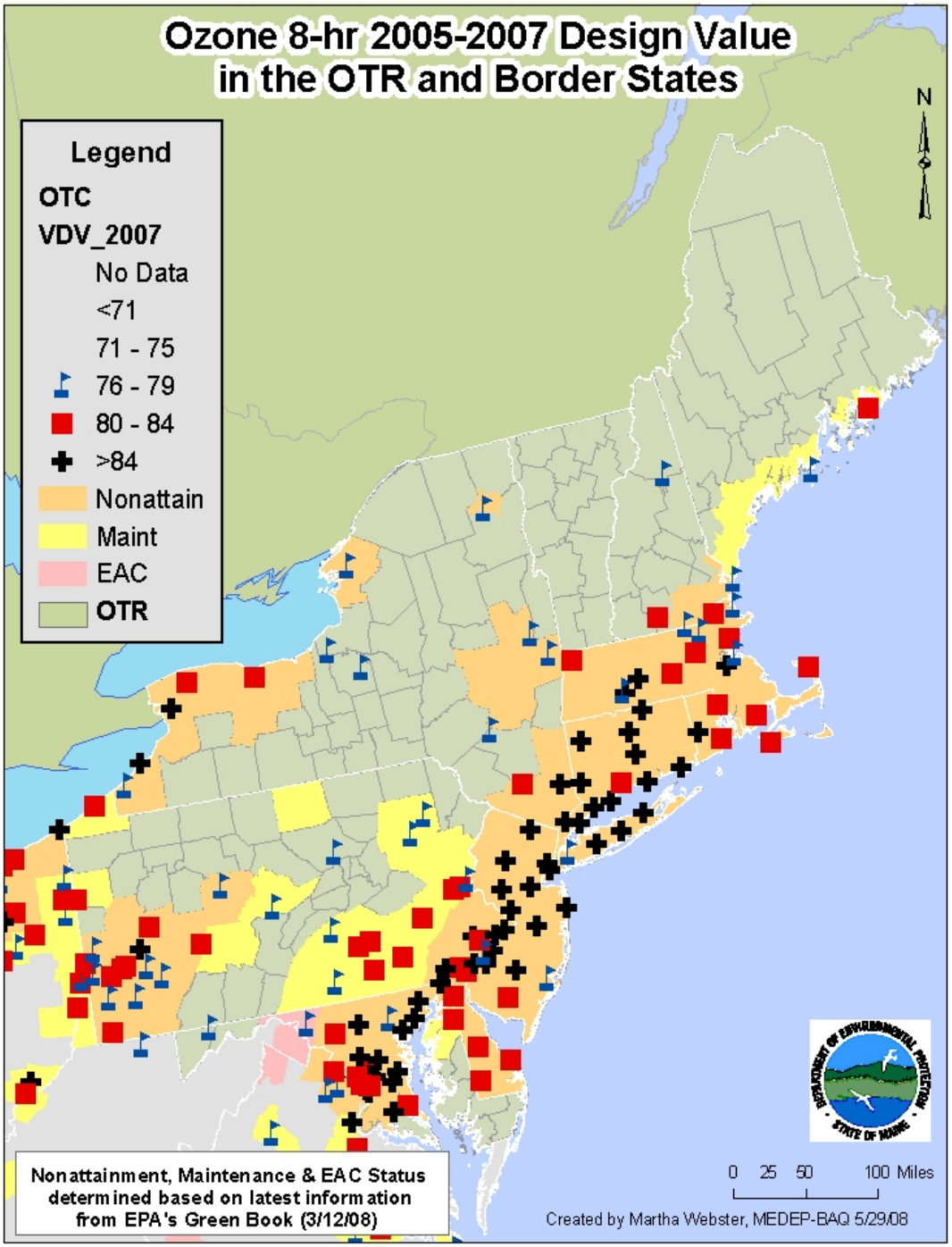
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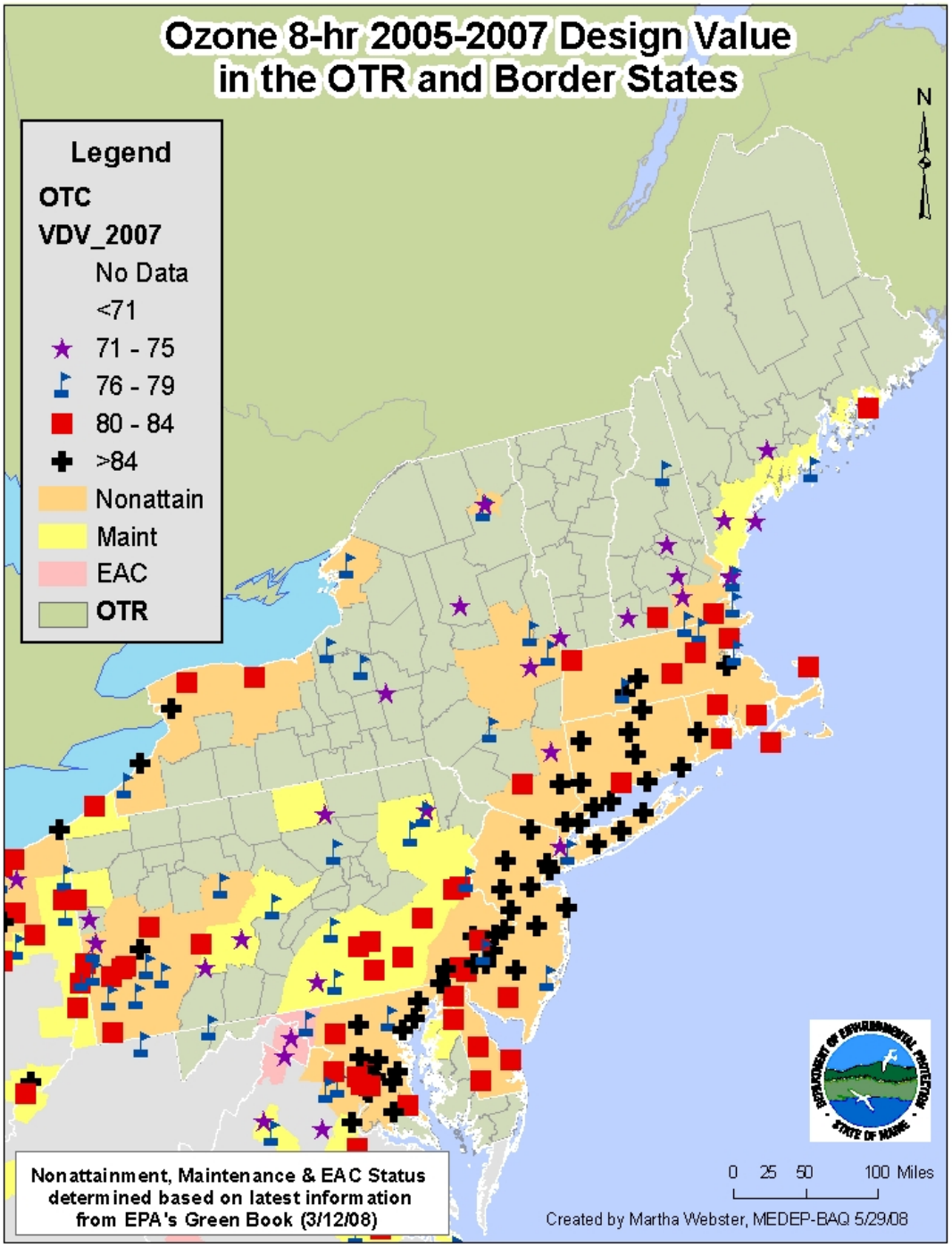
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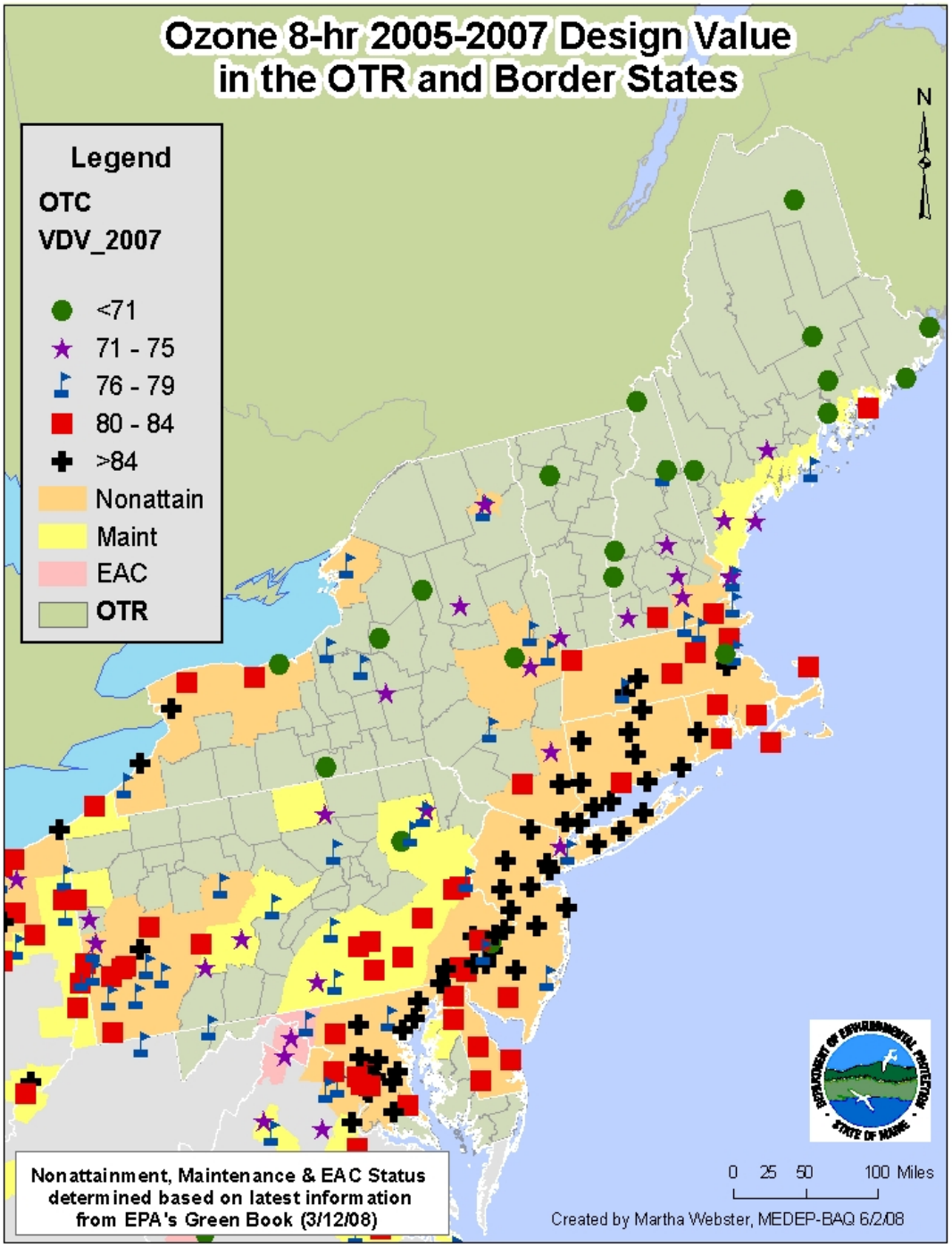
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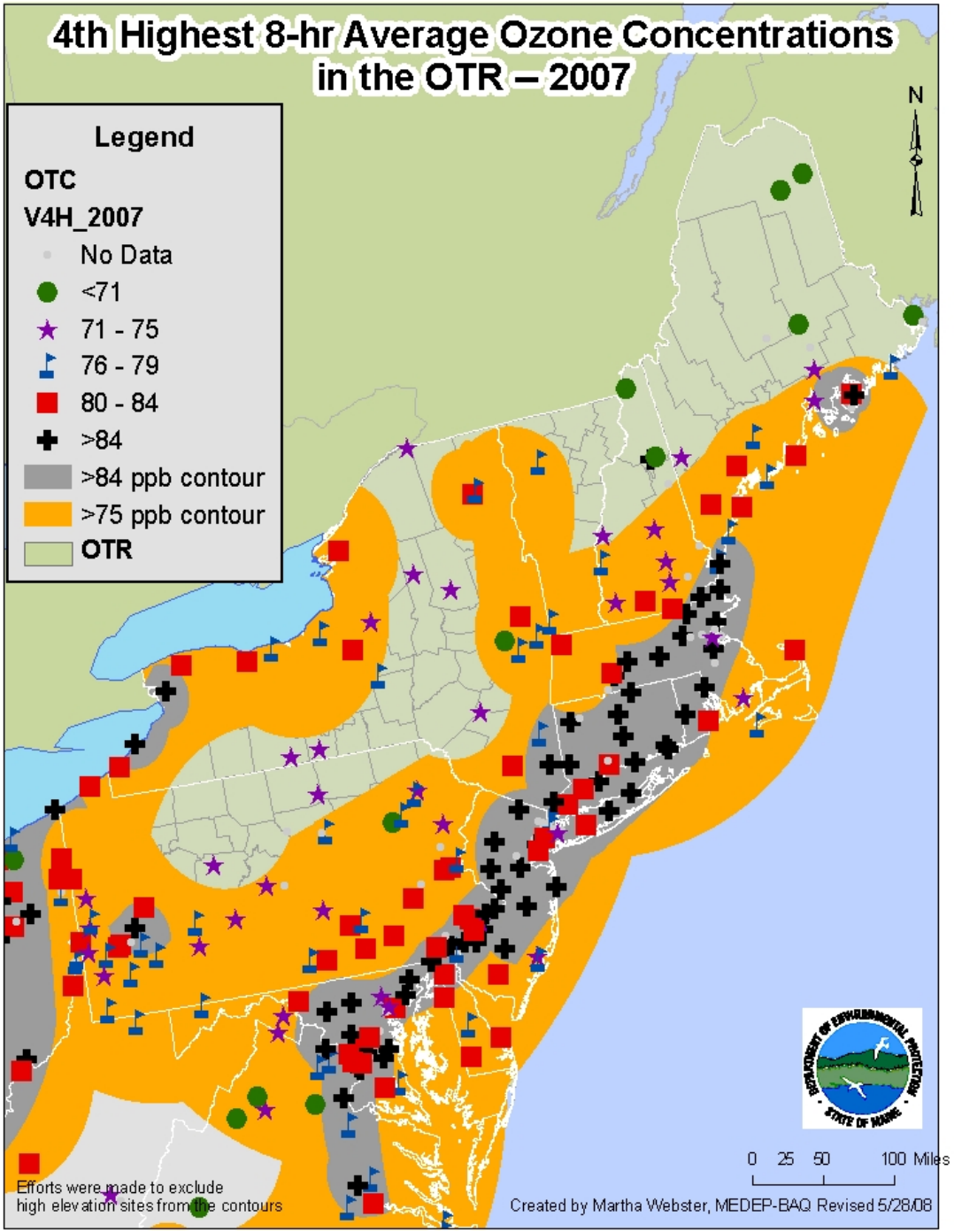
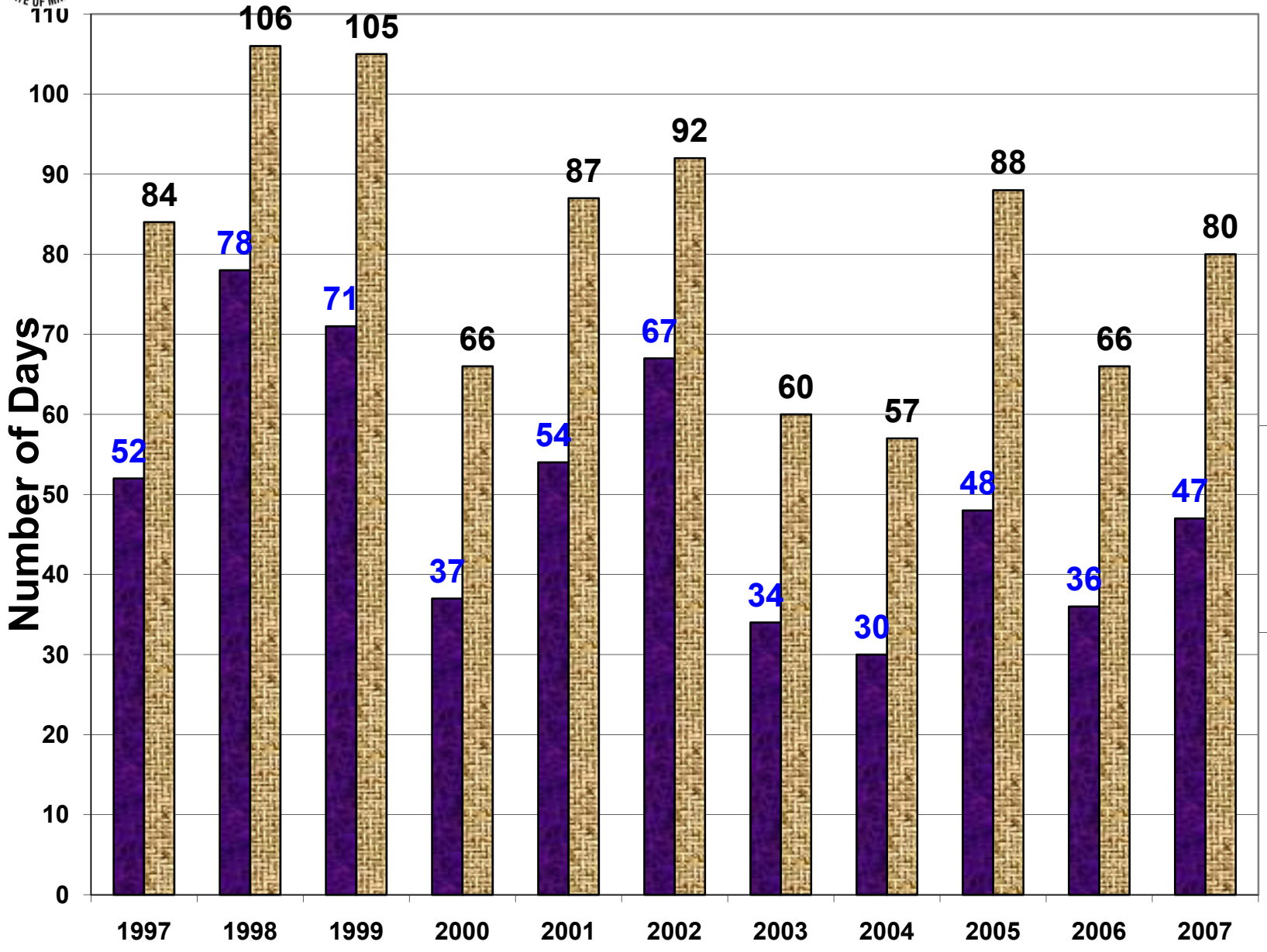
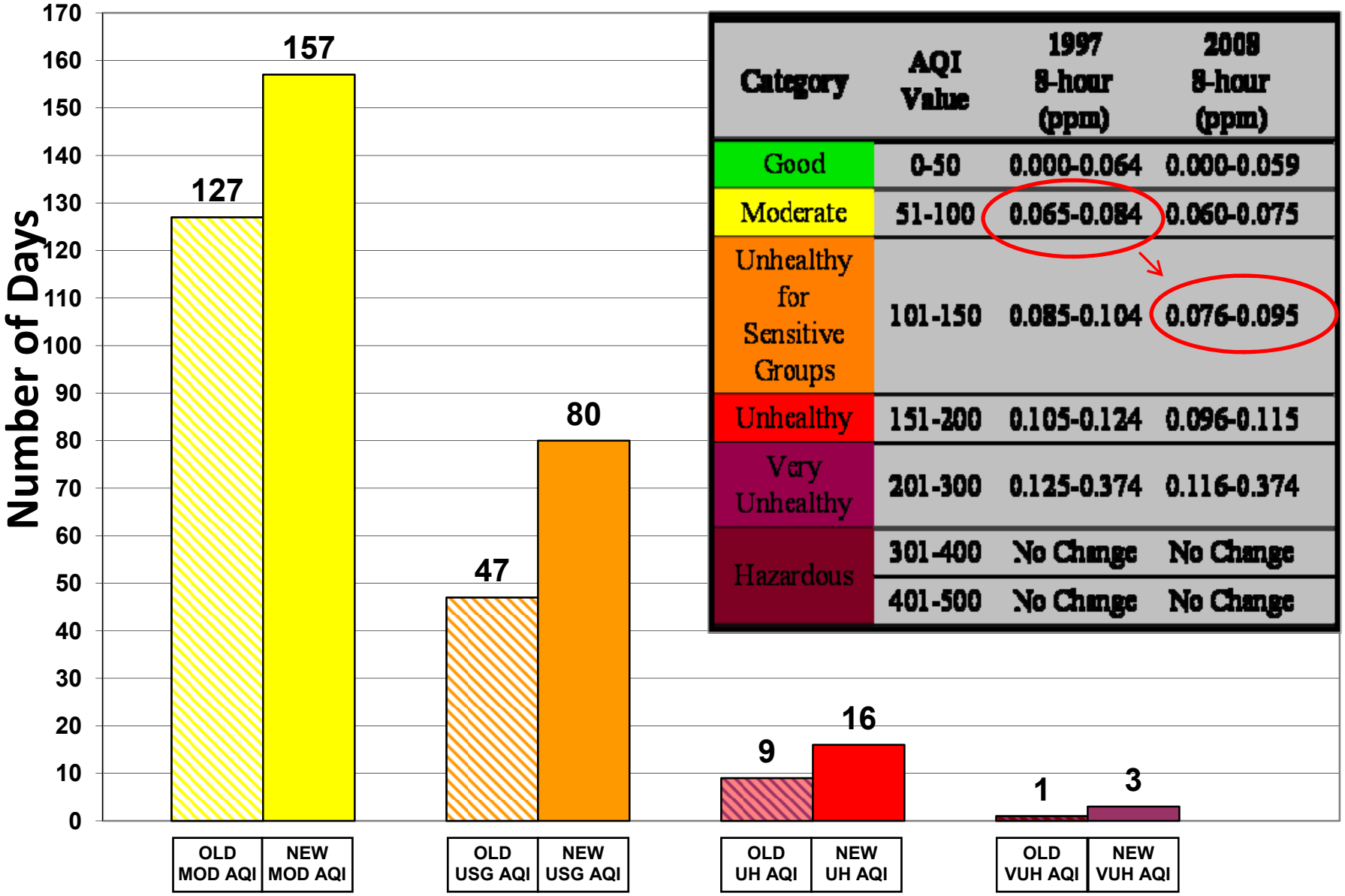

4th Highest 8-hr Average Ozone Concentrations in the OTR – 2007
Legend
OTC
V4H_2007
No Data
<71
71 - 75
76 - 79
80 - 84
>84
>84 ppb contour
>75 ppb contour
OTR
N
0 25 50 100 Miles
Efforts were made to exclude high elevation sites from the contours
Created by Martha Webster, MEDEP-BAQ Revised 5/28/08

Annual Comparison of Days in the OTR Over 1997 & 2008 8-hour Ozone NAAQS



Created by Tom Downs, Maine DEP-BAQ -

2007 Air Quality Index Days
Comparison of the Number of Old vs. New AQI



Category	AQI Value	1997 8-hour (ppm)	2008 8-hour (ppm)
Good	0-50	0.000-0.064	0.000-0.059
Moderate	51-100	0.065-0.084	0.060-0.075
Unhealthy for Sensitive Groups	101-150	0.085-0.104	0.076-0.095
Unhealthy	151-200	0.105-0.124	0.096-0.115
Very Unhealthy	201-300	0.125-0.374	0.116-0.374
Hazardous	301-400	No Change	No Change
	401-500	No Change	No Change

Created by Tom Downs, Maine DEP-BAQ - 6/3/2008

Days Above the New Standard Have Already Occurred…

- Compiled preliminary data from ten OTC states on 8-hour daily maximum readings
- For the pre-ozone season week of April 17 to April 23, 2008, the region had:
  - 103 readings above the new 8-hr ozone standard of 0.075 ppm
  - 6 readings were above 0.090 ppm
  - Highest reading: 0.099 ppm

Co-benefit Opportunities from Energy Efficiency & Clean Energy

- Regional Greenhouse Gas Initiative
  - EE/RE investments by regulated sources
  - EE/RE investments from allowance auction proceeds
- State actions & programs in the Northeast & Mid-Atlantic
  - Reduced energy use from energy efficiency
  - Cleaner alternative energy resources
  - Renewable portfolio standards
  - Other strategies and programs

RGGI

- Regional Greenhouse Gas Initiative – a cooperative effort among 10 Northeast and Mid-Atlantic states to reduce carbon dioxide emissions
- States: CT, DE,ME, MD, MA, NH, NJ, NY, RI and VT
- Reductions via a regional CO2 trading program
  - Sets a cap on total emissions in 10-state region from fossil-fuel fired electric generating units 25MW or larger
  - Allowances representing 1-ton of CO2 are distributed, either through allocation to regulated sources, by auction, or some combination
  - At the end of each compliance period, regulated sources must have sufficient allowances to cover their emissions
  - Auction proceeds invested in energy efficiency and clean energy

Maine & Vermont

- Maine
  - Green Schools Project: ghg survey & audits, promote EE
  - PUC “Efficiency Maine” program: promotes EE in businesses & homes, provides incentive funding for improvements
  - PUC “Carbon Free Homes”: RECs for clean power
- Vermont
  - “Efficiency Vermont”: Non-profit organization providing statewide EE services - resulted in 56 M kWh of annual electric savings for VT households & businesses
  - RPS requiring renewable generation to equal incremental load growth between 2005 & 2012
  - VT Energy Efficiency & Affordability Act
  - VT Energy Independence & Economic Prosperity Act

Massachusetts

- MA Energy Bill
  - Least Cost Procurement – puts efficiency in competition with power generated to meet electricity needs at lowest cost
  - Renewable energy long term contracts pilot program - requires utilities to enter into 10-15 year contracts for RE
  - Energy code – integrates state building code with IEEC
  - Requires 25% of state's electric load be met through DSM & 20% through renewables/alternatives
  - Increases RPS on utilities and electricity suppliers by 1% per year, to a total of 15% in 2020 and 25% in 2030
  - Creates a new alternative energy portfolio standard
- State Revolving Fund EERE
  - Allows integration of EERE into new/upgraded wastewater and drinking water infrastructure projects

Connecticut

- Clean Energy Fund
  - Promotes, develops and invests in clean energy sources for sustainable energy
  - Completed 3.3 MW in projects, another 4.5 MW in progress
- Renewable Portfolio Standard
  - Requires 10% of retail load in 2008 from renewable sources
  - Increases to 14% in 2010
- High Electricity Demand Day Commitment
  - Reduce NOx emissions by 25% on HEDDs by the 2009 ozone season, or as soon as feasible, but no later than 2012
- Clean Car Incentive Program
  - Offers financial incentives (e.g., feebates) or disincentives (e.g., sales tax increase) based on vehicle's ghg emissions

District of Columbia

- Greening DC Building Code
  - Proposed new standards to incorporate ICC 2006 and ASHRAE 189.1
  - Push District buildings to 30% improved performance
- Green Building Act of 2006
  - Phases in green building in DC
  - Requires commercial buildings to be LEED certified
  - Creates Green Building Fund and Green Building Advisory Council

Maryland

- MD Clean Cars Act – adopts CA's stricter vehicle emission standards for GHG, NOx and VOC
- EmPower Maryland – goal of a 15% reduction in energy consumption by 2015
- MD Strategic Electricity Plan
- High Performance Buildings
- Renewable Portfolio Standards – increase to 20% by 2022
- Incentives for use of renewable energy choices

New Jersey

- 100% output based NOx allowance allocations under Clean Air Interstate Rule (CAIR)
- RPS climbs to 20% in the future
- Proposed Energy Master Plan (EMP) includes:
  - Maximizing energy conservation & efficiency to reduce consumption by 20% by 2020
  - Reducing peak demand for electricity by 5,700 MW by 2020
  - Meeting 22.5% of state's power needs from renewables
  - Developing new low carbon emitting, efficient power plants
  - Investing in innovative clean energy technologies and businesses

Pennsylvania

- Special Session House Bill 1
  - $180 M for solar energy
  - $165 M to encourage alternative energy projects
  - $25 M for green buildings
  - $25 M for wind and geothermal
  - $150 M over 7 yrs for weatherization, conservation & alternative energy tax credits
- House Bill 1202
  - Requires every gallon of diesel us an increasing percentage of biodiesel as in-state production levels increase
  - New investments in biofuel producers

Conclusions

- Meeting the new ozone standard presents challenges…
  - Reducing regional transport of pollutants still key
  - Climate and air quality interaction will be a factor
  - Strategies to address climate change will have criteria pollutant impacts
- …As well as opportunities
  - Co-benefits from energy efficiency and clean energy will be valuable
  - Coordination between state environmental, energy and transportation agencies is key